CLAIMS

1. Device for providing computer-aided assistance with movements continuously during processing of a material,

consisting primarily of a referent (R3) of the material to process (19) defined according to an absolute reference system (R1), a work station (9) equipped with target objects (20) having the function of resetting the metrologic system (4) after it has been displaced, a tool scaling system (16), tools (3) for machining the material (19), an absolute reference system (R1) serving as a referent for the computer (2), a computer (2) carrying out the acquisition, storage and processing of the data issued by the metrologic system (4) and continuously propagating the effect of the displacements of the tool(s) (3), relative to the material to be machined (19) and that is being processed, to one or more digital models (M3, M4, M5), one or more metrologic systems (4) having the function of continuously measuring the position of the tool(s) (3) on the one hand and, on the other hand, of the material to be machined (19) and that is being processed, a stimuli generator (5) continuously informing the operator (1) of the position of the tool (3) relative to the material to be machined (19) and that is being processed, by increasing the reality of the actions/reactions that his/her job involves, by means of a choice of multiple and simultaneous sensory returns.

2. Device according to Claim 1, characterized in that the metrologic system (4) is articulated arm for measuring or a localization system holding the tool (3), and is balanced by an adjustable lifting system (10), such as an equalizer, conferring an increased degree of fluidity upon the movements of the operator (1).

3. Device as claimed in any of the preceding claims, characterized in that the position of the metrologic system (4) can be modulated and identified with the aid of the entire set of target objects (20) placed on the work station (9), thereby enabling the intervention space to be increased beyond the work volume of the metrology system.

4. Device as claimed in any of the preceding claims, characterized in that, at any instant, the measurable displacements of the material (19) are taken into account so as to enable the action of the tool (3) on the material (19) to be maintained, thanks to the continuous balancing of the various models with the absolute reference system (R1).

5. Device as claimed in any of the preceding claims, characterized in that the stimuli generator (5) supplies sensory returns of the multiple view type (13 and 13'), at variable scales, of the digital models in which the tool (3) is represented throughout all its displacements, displayed as a reaction reserve (M3)

that can be programmed in relation to the density/scale factor of the material being machined.

6. Device as claimed in any of the preceding claims, characterized in that the stimuli generator (5) supplies sensory returns of the sound type (7 and 7') and/or a pull-back in force which have variable and increasing intensity in relation to the gradual approach of the tool and its reserve (M3) in the digital model (M1) with respect to the closest possible punctual contact.

7. Device as claimed in any of the preceding claims, characterized in that the representation of the tool (M3) in the views (13, 13') is enhanced by the physical representation of the axis of support of the tool (15) and of the shortest path (22) separating the tool model (M3) from the closest possible punctual contact in the digital model M1.

8. Device as claimed in any of the preceding claims, characterized in that the display of the digital model of the shape to be attained, the "mother model" (M1), has a locally improved resolution (21), and is preset by certain characteristics such as the surface menu or the light, to the exact sequence of movements of the tool (3) in space.

9. Iterative action/information method for providing continuous computer-aided (2) assistance and learning with regard to manual movements during

processing of a material (19), characterized in that it includes the following steps consisting in

defining the reference system(s) (R1, R2, R3, R5) with a view to scaling the work station (9),

defining the digital model(s) of the shape to be attained, the "mother model" (M1), and of the material to process (M2), in relation to a referent (R3) known at any instant in relation to an absolute reference system (R1),

establishing the placement of the digital model or models of the shape to be attained (M1) in the digital model(s) of the material being machined (M2),

defining the digital model (M3) of the tool (3) specified by the physical and geometric parameters (reaction reserve, diameter of the tool, eccentricity, etc.) designed to machine the material (19) by scaling it according to a reference point (R2) known at any instant in relation to an absolute reference point (R1),

obtaining the necessary data for knowing the position of the tool (3) in relation to the digital model (M1) of the shape to be attained,

obtaining the quasi-simultaneous updating of the digital model of the machined material (M4) with respect to the effect of the tool (3) on the material (19), which is induced by the manual movements of the operator (1),

obtaining a quasi-simultaneous analysis of the work results furnished by the digital models of the machined material (M4) and of the movements (M5).